

# Beau Rivage Resort & Casino optimizes central plant, improves building comfort with Siemens Demand Flow<sup>®</sup>

## Building Technologies

Biloxi, Mississippi – The Beau Rivage Resort & Casino Hotel is located on the beautiful Gulf of Mexico and is one of the premier MGM Resorts International properties. The Beau Rivage opened in 1999 with 1740 guest rooms and more than 3.2 million square feet of gaming, hotel, resort, convention, and retail space. Because of its dedication to their customers the region, the highest levels of hospitality and occupant comfort are of the utmost importance to the Beau Rivage.

The Beau Rivage chilled water delivery system was unable to deliver its full cooling capacity, requiring the facility to reduce cooling in non-essential areas so it could maintain comfort levels in guest-occupied areas of the resort. Beau Rivage engaged Siemens Industry, Inc., to redesign its chilled water delivery system not only to maximize cooling capacity, but more importantly, to improve building comfort throughout the entire property.

### Client Objectives

The Beau Rivage engineering department was concerned with delivering adequate chilled water to all areas of the casino. The central plant upgrade project included the following goals:

- Improve building and occupant comfort by addressing pumping problems throughout the facility. Challenges included:
  - The chilled water plant had 6,000 nominal tons of cooling capacity, but could deliver only 70% of its capacity. During peak summer months, the facility needed 100% of its total, as-built capacity to adequately cool the entire property.
  - Cooling was reduced in non-essential portions of the resort and casino, such as back-of-the-house and administrative areas, to maximize guest comfort during high-demand cooling periods. The effect, however, was to negatively impact team members' workspaces.
- Update and improve the outdated building automation system, for which replacement parts were becoming increasingly difficult to find.
- Reduce energy costs to help pay for the central plant upgrade and improvements.

### Siemens Solutions

To help the Beau Rivage Casino achieve its goals for the central plant upgrade project, Siemens proposed and implemented the following solutions:

- Install APOGEE<sup>®</sup> building automation system in the central plant with Siemens Demand Flow chiller plant optimization strategy
- Optimize the pumping strategy with Demand Flow to increase the deliverable tonnage of the chilled water plant and maximize plant efficiency
  - Remove five unnecessary 125hp secondary pumps to reduce pumping energy; an ancillary benefit was to increase the central plant's available square footage

Demand Flow is Siemens patent-pending, proven technology that optimizes central chilled water systems to reduce a central plant's total energy consumption by 20-50%. Demand Flow offers a holistic approach for optimizing an entire chilled water system, including potential air-side savings. This optimization increases the deliverable tonnage of the chilled water plant and simplifies plant operations and controls, without sacrificing occupant comfort in favor of energy savings. Demand Flow uses specialized algorithms, delivered through any building automation system, to

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optimize all components of the chilled water system. As a result, central plants can more accurately maintain optimal differential system pressure.

## Client Results

The APOGEE building automation system with Siemens Demand Flow technology was brought online in August 2004—the hottest month of the year for the Biloxi, Mississippi resort. The Beau Rivage Resort & Casino Hotel realized the following results from the central plant upgrade:

- Air-side capacity increased 33% to the full 6,000 nominal tons required to effectively cool the entire property
- Plant energy was reduced by more than 500kW, saving more than \$300,000 in energy costs in the first year alone — representing a full return on investment for Beau Rivage
- Humidity within the property was reduced by approximately 10% as a result of supplying colder chilled water than before, further improving building and occupant comfort

The Beau Rivage Resort & Casino Hotel is a 24-hour operation, with approximately 10,000 occupants at any given time. These circumstances presented unique challenges during the Demand Flow implementation: It was critical to the Beau Rivage that guest rooms and gaming areas never lose chilled water, and that the project could not interfere with business operations. Siemens was able to complete the project within a two-month time frame, and fulfill these customer requirements.

Following the Hurricane Katrina disaster in 2005, damage to the Beau Rivage facility required the shut down of the central plant for approximately one year. During this time the facility was rebuilt. Because the Demand Flow optimization solution was so effective and successful for the facility, the engineering department designed the new plant, which opened in 2006, to again include the Demand Flow solution from Siemens.

*“Previously, we would reduce cooling to non-essential areas of the property, so we could keep our guests comfortable. Within 15 minutes of the Demand Flow conversion, we noticed a 500kW decrease in energy consumption, while increasing our plant capacity to the full 6,000 nominal tons we needed to effectively cool the entire building. Improvements in comfort were felt immediately, which was appreciated by our customers, but especially by our team members who worked throughout the building.”*

*Al Greene  
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